

## **TITLE OF THE INVENTION**

### **STRETCH LABEL ATTACHING DEVICE AND METHOD FOR ATTACHING STRETCH LABEL**

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## **BACKGROUND OF THE INVENTION**

### **Field of the Invention**

The present invention relates to a device for attaching a stretch label on a surface of a good such as containers containing toners, chemicals, cosmetics, foods or the like. In addition, the present invention also relates to a method for attaching a stretch label.

### **Discussion of the Background**

Conventionally, a heat shrinkable label is attached to a container containing a good such as toners. Attaching such a label on a container makes it possible to easily identify the content (for example, a cyan toner, a magenta toner, a yellow toner or a black toner) of the container from outside.

In this case, since a toner is contained in the container after the label is attached to the container upon application of heat thereto, the toner is not affected by the heat.

However, recently there is a need such that a label is attached to an outer surface of a container in which a toner is already contained. In this case, it is not preferable to adhere a label to a container upon application of heat because the properties of the toner in the container tend to be changed. In addition, in this method the label attaching apparatus needs

to have a heating device, and thereby the apparatus becomes large in size. Further, a large amount of carbon dioxide is generated when rising the temperature of the heating device, resulting in warming of the earth. Therefore, recently stretch  
5 labels which can be attached to a good such as toner containers and other containers utilizing only the elasticity of the labels (i.e., without applying heat thereto) have been used.

For example, published examined Japanese Patent Application No. 7-66235 (i.e., unexamined Japanese Patent  
10 Application No. 05-42922) discloses a method for attaching a stretch label on a PET (polyethylene terephthalate) bottle containing a liquid such as carbonated drinks. This method uses a tube-like stretch label having a slip preventing member on an inner surface thereof. At first, an extending/contracting  
15 device is inserted into the stretch label to extend the stretch label at the slip preventing member. Then the stretched label is set on the predetermined position of the container by the extending/contracting device, followed by removal of the device from the container, resulting in attachment of the stretch label  
20 to the container.

However, the method has the following drawbacks. At first, the extending/contracting device is not simple. In addition, since the portions of the stretch label on which the slip preventing member is provided are forcibly extended  
25 (stretched) by about 10 % by the extending/contracting device, the extendability and contractibility (i.e., stretchability) of the label are deteriorated, resulting in defective

attachment of the label.

Because of these reasons, a need exists for a stretch label attaching device by which a stretch label can be easily attached to a predetermined portion of a container with precision.

### SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a stretch label attaching device by which a stretch label can be easily attached to a predetermined portion of a good (such as containers) with precision.

Another object of the present invention is to provide a method for attaching a stretch label by which a stretch label can be easily attached to a predetermined portion of a container with precision.

Briefly these objects and other objects of the present invention as hereinafter will become more readily apparent can be attained by a stretch label attaching device for attaching a stretch label on a good, including:

(1) an adapter (hereinafter referred to as a member (A)) configured to support the stretch label from an inside of the stretch label and having an opening into which the good is inserted when attaching the stretch label on the good;

(2) an adapter support member (hereinafter referred to as a member (C)) configured to support a lower portion of the adapter and having an opening into which the good is inserted

when attaching the stretch label on the good; and

(3) an adapter fixing member (hereinafter referred to as a member (B)) configured to fix the lower portion of the adapter together with the adapter support member.

5        It is preferable that the member (B) is engaged with the member (C) with the member (A) therebetween.

The members (B) and (C) fixedly support the member (A) while contacting at least one point of the member (A).

10        It is preferable that a surface of the member (C) contacting the member (A) has a projected portion and a recessed portion.

The length of the portion of the member (A) extending from the member (B) is shorter than the length of the stretch label.

15        The width of the portion of the member (A) extending from the member (B) decreases in the direction apart from the member (B) (i.e., the portion of the member (A) is tapered). Alternatively, at least the top portion of the member (A) is tapered.

20        The member (A) preferably has a notch extending from the top of the member (A) toward the bottom thereof.

It is preferable that the notch is formed such that an extension of the notch is substantially perpendicular to a tangent line at a point P of the bottom of the member (A). By forming the notch 21 in such a manner, damaging of the member (A) caused when stretch labels are set on the member (A) can be controlled (i.e., the life of the member (A) can be extended).

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The edge of the notch is preferably curled inwardly (i.e.,

toward the inside of the member (A)).

The notch preferably extends so as to meet (reach) the member (B) when the members (A), (B) and (C) are fixedly set.

The member (A) preferably has at least one of an  
5 extending/contracting property and an elasticity.

It is preferable that the member (A) is made of a polyethylene terephthalate and has a thickness of from 10 to 200  $\mu\text{m}$ .

It is also preferable that both the members (A) and (B)  
10 have an elasticity, and the elasticity of the member (B) is larger than that of the member (A).

It is preferable that when the good is inserted into the stretch level attaching device through the openings of the members (A) and (C) to an extent such that the bottom of the  
15 good is level with the bottom of the member (C), the stretch label occupies a predetermined attaching position (i.e., the top of the stretch label is level with the top of the predetermined attaching position of the stretch label).

It is preferable that the outer surface of the member (A)  
20 has a slipping property higher than that of the inner surface of the stretch label, and the inner surface of the member (C) has a slipping property higher than that of the outer surface of the good on which the stretch label is to be attached.

The inner surface of the member (C) is preferably a rugged  
25 surface (i.e., a surface having a projected portion and a recessed portion), namely the member preferably has a good slidability.

It is preferable that the stretch label attaching device further has a counter configured to count the label attached.

As another aspect of the present invention, a method for attaching a stretch label on a good such as containers is  
5 provided which includes:

setting a stretch label on the member (A) of the stretch label attaching device mentioned above;

inserting a good into the stretch label attaching device through the openings of the members (A) and (C) while stretching  
10 the stretch label at a stretching ratio not greater than 5 % so that the stretch label occupies a predetermined attaching position of the good;

releasing the stretch label attaching device from the good while holding the label, to attach the stretch label to  
15 the predetermined attaching position of the good.

It is preferable that the method further includes:

applying a lubricant on the outer surface of the member (A) before the stretch label is set on the member (A); and/or  
applying a lubricant on the inner surface of the member  
20 (C) before the stretch label is set on the member (A).

The stretch label may have a notch to be easily attached to the good.

These and other objects, features and advantages of the  
25 present invention will become apparent upon consideration of the following description of the preferred embodiments of the present invention taken in conjunction with the accompanying

drawings.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Various other objects, features and attendant advantages  
5 of the present invention will be more fully appreciated as the  
same becomes better understood from the detailed description  
when considered in connection with the accompanying drawings  
in which like reference characters designate like corresponding  
parts throughout and wherein:

10 Fig. 1 is a cross sectional view of the stretch label  
attaching device of the present invention;

Fig. 2A is a perspective view of the member (A)  
constituting the stretch label attaching device of the present  
invention;

15 Fig. 2B is a perspective view illustrating a notch formed  
on the member (A);

Fig. 2C is a schematic view of the member (A) for  
explaining the positional relationship between the notch and  
the member (A);

20 Fig. 3 is a perspective view of the member (B) constituting  
the stretch label attaching device of the present invention;

Fig. 4A is a perspective view of the member (C)  
constituting the stretch label attaching device of the present  
invention;

25 Fig. 4B is a perspective view illustrating the projected  
portion and recessed portion of the outer surface of the member  
(C);

Fig. 5 is a perspective view of a stretch label which is to be attached by the stretch label attaching device of the present invention;

Fig. 6 is a perspective view of a good (container) to which a stretch label is attached by the stretch label attaching device of the present invention;

Figs. 7 to 11 are schematic views for explaining the method of the present invention for attaching a stretch label to a good (container); and

Fig. 12 is a schematic view illustrating a good (container) to which a stretch label is attached.

#### **DETAILED DESCRIPTION OF THE INVENTION**

The present invention will be explained in detail referring to drawings.

As illustrated in Fig. 1, a device 1 for attaching a stretch label (hereinafter referred to as a stretch label attaching device 1) of the present invention includes an adapter (i.e., a member (A)) configured to support a stretch label from the inside of the stretch label and which is illustrated in Fig. 2A; an adapter fixing member (i.e., a member (B)) configured to fix the member (A) and which is illustrated in Fig. 3; and an adapter support member (i.e., a member (C)) configured to support the member (A) and which is illustrated in Fig. 4.

The member (A) has a cylindrical form (or a frustum form) and includes plural notches 21, which extend from the top of the member (A) toward the bottom thereof. In addition, the



member (A) preferably includes a cut portion 22 which extends from the top to the bottom of the member (A) (i.e., the member (A) is cut at the portion 22).

5 The member (B) has a form like a donut and the inside diameter of the member (B) increases from the middle toward the bottom thereof. Namely, the member (B) has a slanted portion 31 as illustrated in Fig. 3.

10 The member (C) has a frustum form and the diameter of the outer surface of the member (C) increases from the top toward the middle thereof. Namely, the member (C) has a slanted portion 41 as illustrated in Fig. 4A. In addition, the slanted portion 41 has a projected portion and a recessed portion as illustrated in Fig. 4B to prevent the member (A) from releasing from the members (B) and (C).

15 Referring to Fig. 1, the slanted portions 31 and 41 have substantially the same angle of inclination so that the member (A) can be fixed by being sandwiched by the slanted portions 31 and 41. Namely, the member (A) is fixed by the member (B) and the member (C) which are engaged with each other. The member  
20 (A) is supported by the members (B) and (C) while contacting one or more portions of the members (B) and (C).

In the stretch label attaching device of the present invention, the member (A) moves while the inner surface thereof contacts a good such as containers and the outer surface thereof  
25 supports a stretch label by contacting the inner surface of the stretch label. Therefore, the member (A) tends to be relatively easily damaged compared to the members (B) and (C). However,

in the stretch label attaching device of the present invention, the member (A) can be easily replaced with new one because the members (A), (B) and (C) can be easily separated from the others.

The surface of the slanted portion 41 of the member (C) preferably has a projected portion and a recessed portion. As illustrated in Fig. 4B, the slanted portion 41 preferably has a ridge and a groove. When the slanted portion 41 has such a roughened surface, the member (A) can be supported by the member (B) and the member (C) while strongly pressed to the member (C) by the member (B). Therefore, occurrence of a problem in that the stretch label attaching device is separated into the members (A), (B) and (C) in use can be prevented.

By using such a stretch label attaching device, the stretching ratio of the stretch label to be attached can be controlled so as to be not greater than 5 %, and thereby occurrence of a problem in that the stretch label loses its extending/contracting ability (stretchability) can be prevented. In addition, the operating efficiency of the operations using the stretch label attaching device is 5 or more times the operating efficiency of conventional manual operations. Further, stretch labels can be attached to a good with high positional precision.

When the length of the portion of the member (A) extending from the member (B) is shorter than the height of the stretch label to be attached, the stretch label can be easily set on and released from the member (A). It is preferable that at least the top portion of the member (A) is continuously tapered. It

is more preferable that the member (A) is tapered such that the diameter is continuously increases from the upper portion thereof toward the bottom portion. When the member (A) has such constitution, the member (A) can be easily inserted into the stretch label to be attached.

The member (A) preferably has a notch 21 on a portion thereof such that the member (A) can be easily inserted into the stretch label to be attached. The number of the notch 21 formed on the member (A) is determined depending on the conditions of the stretch label to be attached, and is generally from 2 to 6.

As illustrated in Fig. 2C, it is preferable that the notch 21 is formed such that an extension L1 of the notch 21 is substantially perpendicular to a tangent line L2 at a point A1 of the bottom of the member (A). By forming the notch 21 in such a manner, damaging of the member (A) caused when stretch labels are set on the member (A) can be controlled (i.e., the life of the member (A) can be extended).

In addition, as illustrated in Fig. 2B, the edge of the notch 21 is preferably curled inwardly to control damaging of the member (A) caused when stretch labels are set on the member (A) and to prevent the stretch label from breaking.

Further, the notch 21 preferably reaches the member (B) (i.e., the end portion of the notch 21 faces the member (B)) when the member (A) is fixed by the members (B) and (C). By forming such a notch, damaging of the member (A) caused when stretch labels are set on the member (A) can be controlled.

The member (A) preferably has an extending/contracting property to control damaging of the member (A) caused when labels are set on the member (A).

5 It is preferable that the member (A) is made of a polyethylene terephthalate and has a thickness of from 10 to 200  $\mu\text{m}$  so as not to be damaged when stretch labels are set on the member (A).

In the stretch label attaching device of the present invention, the member B preferably has an elasticity larger than  
10 that of the member (A) to control damaging of the member (A) caused when stretch labels are set on the member (A).

It is preferable that when a good on which a stretch label is to be attached is inserted into the members (C) and (A) so that the bottom of the good is level with the bottom of the member  
15 (C) (i.e., the bottom of the stretch label attaching device), the stretch label occupies a predetermined attaching position (i.e., the top of the stretch label is level with the top of the predetermined attaching position of the label). Namely, as illustrated in Fig. 10, the height L of the combination of  
20 the members (B) and (C) is preferably adjusted such that when a good on which a stretch label is to be attached is inserted to the stretch label attaching device so that the bottom of the good is level with the bottom of the member (C), the top of the stretch label has a position level with a top P of the  
25 predetermined attaching position of the stretch label.

The outer surface of the member (A) preferably has a slipping property higher than that of the inner surface of the

stretch label to easily attach a stretch label to a good. The slipping property can be enhanced by, for example, applying a silicone or the like material to the outer surface of the member (A).

5           In addition, the inner surface of the member (C) has a slipping property higher than that of the outer surface of the container to which a stretch label is to be attached, to easily attach a stretch label to a good. The slipping property can be enhanced by, for example, applying a silicone or the like  
10 material thereto.

          The inner surface of the member (C) is preferably rugged (i.e., the inner surface has a projected portion and a recessed portion) to easily attach a stretch label to a good.

          Further, the member (C) preferably has a good slidability  
15 to easily attach a stretch label to a good because the member (C) can be slid onto the good. In order to impart good slidability to the member (C), the member (C) preferably includes a material such as polyacetals, nylons and polyethylenes.

20           The members (A), (B) and (C) constituting the stretch label attaching device of the present invention are typically made of a material such as plastics and metals. In particular, the member (A) is preferably made of a plastic.

          A counter is preferably provided on the stretch label  
25 attaching device to automatically count the number of the labels attached to goods (containers). By setting a counter on the stretch label attaching device, the stretch label attaching

operation can be efficiently performed because the operator can concentrate on the operation without counting the number of the labels. Specifically, the number of the labels attached to goods can be counted by, for example, setting a sensor such as  
5 microswitches at a position between the member (A) and the member (B). When a label is set a predetermined position, the label is mechanically, physically (optically) or electrically detected and thereby the number of labels attached can be counted.

10           Then the method for attaching a stretch label to a good (a bottle, in this case) will be explained referring to Figs. 7 to 12.

(1) at first, the stretch label attaching device 1 (i.e., the combination of the members (A), (B) and (C)) is supported  
15 by a hand, and a stretch label 5 is set on the member (A) by another hand such that the label covers the member (A) as illustrated in Fig. 7;

(2) then the stretch label 5 is inserted to the stretch label attaching device 1 such that the lower end of the stretch  
20 label 5 contacts the member B while the device 1 is supported by a hand as illustrated in Fig. 8;

(3) a bottle 6 is inserted into the stretch label attaching device 1 having the stretch label 5 thereon while the stretch label 5 is support by a hand so as not move, as illustrated  
25 in Fig. 9;

(4) the stretch label attaching device 1 is lowered by a hand while the top of the bottle is supported by another hand

as illustrated in Fig. 10;

(5) when the stretch label 5 arrives at a predetermined position of the bottle, the stretch label 5 is held by, for example, fingers; and

5 (6) then the stretch label attaching device 1 is detached from the bottle 6 while the stretch label 5 is held by fingers as illustrated in Fig. 11.

Thus, the stretch label 5 is attached to the bottle 6 as illustrated in Fig. 12.

10 By using the stretch label attaching device of the present invention, the stretching ratio of the stretch label can be controlled so as to be not greater than 5 %, and therefore a problem such that the stretch label loses its stretchability. In addition, the operation efficiency of this method is five  
15 or more times that of conventional manual label attaching operations. Further, the method has an advantage in that stretch labels can be attached with a relatively high positional precision compared to conventional manual label attaching methods.

20 This label attaching operation is not limited to a manual operation and can be performed mechanically.

#### Effect of the present invention

By using the stretch label attaching device of the present  
25 invention, a stretch label can be easily attached to a good such as containers with high precision.

This document claims priority and contains subject matter related to Japanese Patent Application No. 2002-234195 filed on August 9, 2002, incorporated herein by reference.

5        Having now fully described the invention, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto without departing from the spirit and scope of the invention as set forth therein.